AMENDMENTS TO THE CLAIMS

1. (Withdrawn) A method of providing a heat conductive semiconductor package, said method comprising the steps of:

hermetically sealing a semiconductor chip within a package, said package enclosing a first gas at a first pressure and a source of releasable hydrogen; and

pressurizing said hermetically sealed package from said first pressure to a second pressure by releasing said hydrogen into said first gas, so as to provide a second pressure gas having an increased hydrogen content.

2. (Withdrawn) A method according to claim 1, wherein said first gas comprises helium.

3. (Withdrawn) A method according to claim 2, wherein said second pressure gas comprises a mixture of said helium and said hydrogen.

4. (Withdrawn) A method according to claim 3, wherein said gas mixture comprises helium and from about 3% to about 12% hydrogen.

5. (Withdrawn) A method according to claim 3, wherein said gas mixture comprises helium and from about 5% to about 10% hydrogen.

6. (Withdrawn) A method according to claim 1, wherein said second pressure is from about 5 MPa to about 50 MPa.

7. (Withdrawn) A method according to claim 1, wherein said first gas is hydrogen.

8. (Withdrawn) A method according to claim 7, wherein said second pressure is from about 5 MPa to about 50 MPa.

9. (Withdrawn) A method according to claim 1, wherein said first gas comprises a mixture of helium and hydrogen.

10. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen is a metal hydride.

11. (Withdrawn) A method according to claim 10, wherein said metal hydride is formed so as to provide a thin film metal hydride.

12. (Withdrawn) A method according to claim 10, wherein said metal hydride is titanium hydride.

13. (Withdrawn) A method according to claim 1, wherein said step of releasing hydrogen comprises heating the source of releasable hydrogen followed by enabling said source of releasable hydrogen to cool at a rate sufficient to minimize the re-absorption of hydrogen by said source.

14. (Withdrawn) A method according to claim 13, wherein said step of heating the source of releasable hydrogen comprises using at least one heat source.

15. (Withdrawn) A method according to claim 13, wherein said step of heating the source of releasable hydrogen comprises using a plurality of heat sources.

16. (Withdrawn) A method according to claim 13, wherein said step of heating is effected with a source of heat external to the package.

17. (Withdrawn) A method according to claim 16, wherein said step of heating is effected with a laser.

18. (Withdrawn) A method according to claim 17, wherein said step of heating is effected with an eximer laser.

19. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen is at least one integrated circuit-bearing chip, said chip comprising at least one surface location of a layer of metal hydride.

20. (Withdrawn) A method according to claim 19, said at least one chip comprising a plurality of surface locations of a layer of metal hydride.

21. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen is a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride.

22. (Withdrawn) A method according to claim 21, each of said plurality of chips comprising a plurality of surface locations of a layer of metal hydride.

23. (Withdrawn) A method according to claim 19, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with the at least one integrated circuit-bearing chip.

24. (Withdrawn) A method according to claim 21, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with each of the plurality of integrated circuit-bearing chips.

25. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen is at least one non-integrated circuit-bearing chip, said chip comprising a surface layer of metal hydride.

26. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen is a plurality of non-integrated circuit-bearing chips, each of said plurality of chips comprising a surface layer of metal hydride.

27. (Withdrawn) A method according to claim 25, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with the at least one non-integrated circuit-bearing chip.

28. (Withdrawn) A method according to claim 26, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with each of the plurality of non-integrated circuit-bearing chips.

29. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen comprises:

at least one integrated circuit-bearing chip, said at least one chip comprising at least one surface location of a layer of metal hydride, and

at least one non-integrated circuit-bearing chip, said at least one chip comprising a surface layer of metal hydride.

30. (Withdrawn) A method according to claim 29, said at least one integrated circuit-bearing chip comprising a plurality of surface locations of a layer of metal hydride.

31. (Withdrawn) A method according to claim 1, wherein said source of releasable hydrogen comprises:

a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride, and

a plurality non-integrated circuit-bearing chip, each of said plurality of chips comprising a surface layer of metal hydride.

32. (Withdrawn) A method according to claim 31, each of said plurality of integrated circuit-bearing chips comprising a plurality of surface locations of a layer of metal hydride.

33. (Withdrawn) A method according to claim 29, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with each of the at least one integrated circuit-bearing chip and the at least one non-integrated circuit-bearing chip.

34. (Withdrawn) A method according to claim 31, wherein said step of heating the source of releasable hydrogen comprises using a heater and heater circuitry associated with each of the plurality of integrated circuit-bearing chips and the plurality of non-integrated circuit-bearing chips.

35. (Withdrawn) A method according to claim 9, wherein said mixture comprises from about 3% to about 12% hydrogen.

36. (Withdrawn) A method according to claim 35, wherein said mixture comprises about 5% hydrogen.

37. (Previously presented) A semiconductor package comprising:

a hermetically sealed enclosure surrounding said package;

a semiconductor chip within said enclosure;

a first gas within said enclosure; and

a thin layer deposited over at least part of said semiconductor chip comprising a source of releasable hydrogen within said enclosure, said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the pressure associated with said first gas.

38. (Original) A package according to claim 37, wherein said first gas comprises helium.

39. (Original) A package according to claim 37, wherein said first gas comprises hydrogen.

40. (Original) A package according to claim 37, wherein said first gas comprises a mixture of helium and hydrogen.

41. (Original) A package according to claim 37, wherein said source of releasable hydrogen is a metal hydride.

42. (Original) A package according to claim 41, wherein said metal hydride is titanium hydride.

43. (Original) A package according to claim 37, said package further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

44. (Original) A package according to claim 37, said package further comprising a plurality of heat sources for heating the source of releasable hydrogen so as to effect the release of hydrogen.

45. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen is at least one integrated circuit-bearing chip, said at least one chip comprising at least one surface location of a layer of metal hydride.

46. (Withdrawn) A package according to claim 45, said at least one chip comprising a plurality of surface locations of a layer of metal hydride.

47. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen is a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride.

48. (Withdrawn) A package according to claim 47, each of said plurality of chips comprising a plurality of surface locations of a layer of metal hydride.

49. (Withdrawn) A package according to claim 45, said at least one integrated circuit-bearing chip comprising a heater and associated heater circuitry.

50. (Withdrawn) A package according to claim 47, each of said plurality of integrated circuit-bearing chips comprising a heater and associated heater circuitry.

51. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen is at least one non-integrated circuit-bearing chip, said at least one chip comprising a surface layer of metal hydride.

52. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen is a plurality of non-integrated circuit-bearing chips, each of said plurality of chips comprising a surface layer of metal hydride.

53. (Withdrawn) A package according to claim 51, said at least one non-integrated circuit-bearing chip comprising a heater and associated heater circuitry.

54. (Withdrawn) A package according to claim 52, each of said plurality of non-integrated circuit-bearing chips comprising a heater and associated heater circuitry.

55. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen comprises:

at least one integrated circuit-bearing chip, said at least one chip comprising at least one surface location of a layer of metal hydride, and

at least one non-integrated circuit-bearing chip, said at least one chip comprising a surface layer of metal hydride.

56. (Withdrawn) A package according to claim 37, said at least one integrated circuit-bearing chip comprising a plurality of surface locations of a layer of metal hydride.

57. (Withdrawn) A package according to claim 37, wherein said source of releasable hydrogen comprises:

a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride, and

a plurality of non-integrated circuit-bearing chips, each of said plurality of chips comprising a surface layer of metal hydride.

58. (Withdrawn) A package according to claim 55, wherein said at least one integrated circuit-bearing chip comprises a heater and associated heater circuitry, and said at least one non-integrated circuit-bearing chip comprises a heater and associated heater circuitry.

59. (Withdrawn) A package according to claim 57, wherein each of said plurality of integrated circuit-bearing chips comprises a heater and associated heater circuitry, and each of said plurality of non-integrated circuit-bearing chips comprises a heater and associated heater circuitry.

60. (Original) A package according to claim 37, further comprising a substrate, wherein said chip is attached to the substrate with a controlled collapse chip connection.

61. (Withdrawn) A package according to claim 37, further comprising a heat sink in communication with said package.

62. (Previously presented) A semiconductor package comprising:

a hermetically sealed enclosure surrounding said package;

a semiconductor chip within said enclosure;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon application of heat, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

63. (Original) A package according to claim 62, wherein said first gas component comprises helium.

64. (Original) A package according to claim 62, wherein said first gas component comprises hydrogen.

65. (Original) A package according to claim 62, wherein said first gas component comprises a mixture of helium and hydrogen.

66. (Currently amended) ~~A package according to claim 65,~~

A semiconductor package comprising:

a hermetically sealed enclosure surrounding said package;

a semiconductor chip within said enclosure;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure, said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon application of heat, and wherein said first gas component comprises helium and from about 3% to about 12% hydrogen and is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

67. (Currently amended) A package according to claim ~~65~~ 66, wherein said gas comprises helium and from about 5% to about 10% hydrogen.

68. (Original) A package according to claim 62, wherein said source of releasable hydrogen is a metal hydride.

69. (Original) A package according to claim 68, wherein said metal hydride is titanium hydride.

70. (Original) A package according to claim 62, said package further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

71. (Original) A package according to claim 62, said package further comprising a plurality of heat sources for heating the source of releasable hydrogen so as to effect the release of hydrogen.

72. (Original) A package according to claim 62, wherein said gas has a pressure of from about 5 MPa to about 50 MPa.

73. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen is at least one integrated circuit-bearing chip, said at least one chip comprising at least one surface location of a layer of metal hydride.

74. (Withdrawn) A package according to claim 73, said at least one chip comprising a plurality of surface locations of a layer of metal hydride.

75. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen is a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride.

76. (Withdrawn) A package according to claim 75, each of said plurality of chips comprising a plurality of surface locations of a layer of metal hydride.

77. (Withdrawn) A package according to claim 73, said at least one integrated circuit-bearing chip comprising a heater and associated heater circuitry.

78. (Withdrawn) A package according to claim 75, each of said plurality of integrated circuit-bearing chips comprising a heater and associated heater circuitry.

79. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen is at least one non-integrated circuit-bearing chip, said at least one chip comprising a surface layer of metal hydride.

80. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen is a plurality of non-integrated circuit-bearing chips, each of said plurality of chips comprising a surface layer of metal hydride.

81. (Withdrawn) A package according to claim 79, said at least one non-integrated circuit-bearing chip comprising a heater and associated heater circuitry.

82. (Withdrawn) A package according to claim 80, each of said plurality of non-integrated circuit-bearing chips comprising a heater and associated heater circuitry.

83. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen comprises:

at least one integrated circuit-bearing chip, said at least one chip comprising at least one surface location of a layer of metal hydride, and

at least one non-integrated circuit-bearing chip, said at least one chip comprising a surface layer of metal hydride.

84. (Withdrawn) A package according to claim 83, said at least one integrated circuit-bearing chip comprising a plurality of surface locations of a layer of metal hydride.

85. (Withdrawn) A package according to claim 62, wherein said source of releasable hydrogen comprises:

a plurality of integrated circuit-bearing chips, each of said plurality of chips comprising at least one surface location of a layer of metal hydride, and

a plurality of non-integrated circuit-bearing chips, each of said plurality of chips comprising a surface layer of metal hydride.

86. (Withdrawn) A package according to claim 83, wherein said at least one integrated circuit-bearing chip comprises a heater and associated heater circuitry, and said at least one non-integrated circuit-bearing chip comprises a heater and associated heater circuitry.

87. (Withdrawn) A package according to claim 85, wherein each of said plurality of integrated circuit-bearing chips comprises a heater and associated heater circuitry, and each of said plurality of non-integrated circuit-bearing chips comprises a heater and associated heater circuitry.

88. (Previously presented) A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

an integrated circuit within said enclosure;

a gas at a first pressure within said enclosure; and

a thin layer deposited over at least part of said semiconductor chip comprising a source of releasable hydrogen within said enclosure, said releasable hydrogen capable of pressurizing the space within said enclosure to a pressure above the first pressure.

89. (Original) A chip according to claim 88, wherein said gas comprises helium.

90. (Original) A chip according to claim 88, wherein said gas comprises hydrogen.

91. (Original) A chip according to claim 88, wherein said gas comprises a mixture of helium and hydrogen.

92. (Original) A chip according to claim 88, wherein said source of releasable hydrogen is a metal hydride.

93. (Original) A chip according to claim 92, wherein said metal hydride is titanium hydride.

94. (Original) A chip according to claim 88, said chip further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

95. (Original) A chip according to claim 88, said chip further comprising a plurality of heat sources for heating the source of releasable hydrogen so as to effect the release of hydrogen.

96. (Original) A chip according to claim 88, wherein said source of releasable hydrogen is at least one surface location of a layer of metal hydride.

97. (Original) A chip according to claim 88, wherein said source of releasable hydrogen is a plurality of surface locations of a layer of metal hydride.

98. (Original) A chip according to claim 88, further comprising a heater and associated heater circuitry.

99. (Previously presented) A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

an integrated circuit within said enclosure;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon application of heat, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

100. (Original) A chip according to claim 99, wherein said gas comprises helium.

101. (Original) A chip according to claim 99, wherein said gas comprises hydrogen.

102. (Original) A chip according to claim 99, wherein said gas comprises a mixture of helium and hydrogen.

103. (Currently Amended) ~~A chip according to claim 102, wherein said gas~~ A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

an integrated circuit within said enclosure;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon

application of heat, and wherein said first gas component comprises helium and from about 3% to about 12% hydrogen and is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

104. (Currently Amended) A chip according to claim ~~102~~ 103, wherein said gas comprises helium and from about 5% to about 10% hydrogen.

105. (Original) A chip according to claim 99, wherein said source of releasable hydrogen is a metal hydride.

106. (Original) A chip according to claim 105, wherein said metal hydride is titanium hydride.

107. (Original) A chip according to claim 99, said chip further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

108. (Original) A chip according to claim 99, said chip further comprising a plurality of heat sources for heating the source of releasable hydrogen so as to effect the release of hydrogen.

109. (Original) A chip according to claim 99, wherein said source of releasable hydrogen is at least one surface location of a layer of metal hydride.

110. (Original) A chip according to claim 99, wherein said source of releasable hydrogen is a plurality of surface locations of a layer of metal hydride.

111. (Original) A chip according to claim 99, further comprising a heater and associated heater circuitry.

112. (Currently amended) A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

a gas at a first pressure within said enclosure; and

a source of releasable hydrogen within said enclosure, said source of releasable hydrogen capable of releasing hydrogen for pressurizing the space within said enclosure to a pressure above the first pressure.

113. (Original) A chip according to claim 112, wherein said gas comprises helium.

114. (Original) A chip according to claim 112, wherein said gas comprises hydrogen.

115. (Original) A chip according to claim 112, wherein said gas comprises a mixture of helium and hydrogen.

116. (Original) A chip according to claim 112, wherein said source of releasable hydrogen is a metal hydride.

117. (Original) A chip according to claim 116, wherein said metal hydride is titanium hydride.

118. (Withdrawn) A chip according to claim 112, wherein said source of releasable hydrogen is a surface layer of metal hydride, said layer constituting an entire surface of the chip.

119. (Original) A chip according to claim 112, said chip further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

120. (Original) A chip according to claim 112, said chip further comprising a heater and associated heater circuitry.

121. (Previously presented) A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon application of heat, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

122. (Original) A chip according to claim 121, wherein said gas comprises helium.

123. (Original) A chip according to claim 121, wherein said gas comprises hydrogen.

124. (Original) A chip according to claim 121, wherein said gas comprises a mixture of helium and hydrogen.

125. (Currently Amended) ~~A chip according to claim 124, wherein said gas~~ A semiconductor chip comprising:

a hermetically sealed enclosure surrounding said chip;

a heat-activated source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen upon application of heat, and wherein said first gas component comprises helium and from about 3% to about 12% hydrogen and is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

126. (Currently Amended) A chip according to claim ~~124~~ 125, wherein said gas comprises helium and from about 5% to about 10% hydrogen.

127. (Original) A chip according to claim 121, wherein said source of releasable hydrogen is a metal hydride.

128. (Original) A chip according to claim 127, wherein said metal hydride is titanium hydride.

129. (Withdrawn) A chip according to claim 121, wherein said source of releasable hydrogen is a surface layer of metal hydride, said layer constituting an entire surface of the chip.

130. (Original) A chip according to claim 121, said chip further comprising at least one heat source for heating the source of releasable hydrogen so as to effect the release of hydrogen.

131. (Original) A chip according to claim 121, said chip further comprising a heater and associated heater circuitry.

132. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing on a substrate a layer of silicon;

patterning said deposited layer of silicon to form at least one thin film heat source;

depositing upon said patterned layer a layer of hydride-forming metal;

patterning said layer of hydride-forming metal so as to correspond with the patterned layer of the at least one heat source; and

charging said patterned layer of hydride-forming metal with hydrogen so as to provide a patterned layer of metal hydride.

133. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing on a substrate a layer of doped polycrystalline silicon;

patterning said deposited layer of doped polycrystalline silicon to form one or a plurality of thin film resistors capable of serving as heating elements when connected electrically to an external power source;

depositing upon said patterned layer an insulating layer to chemically protect and electrically isolate the one or a plurality of resistors;

depositing upon said insulating layer a layer of hydride-forming metal;

patterning said layer of hydride-forming metal so as to correspond with the patterned layer of the one or a plurality of thin film resistors; and

charging said patterned layer of hydride-forming metal with hydrogen so as to provide a patterned layer of metal hydride.

134. (Withdrawn) A method of fabricating according to claim 133, wherein said substrate is silicon, said method further comprising oxidizing the silicon substrate before said step of depositing the layer of doped polycrystalline silicon.

135. (Withdrawn) A method of fabricating according to claim 133, wherein said hydride-forming metal is selected from the group consisting of titanium, zirconium, chromium, vanadium, and tantalum.

136. (Withdrawn) A method of fabricating according to claim 133, wherein said hydride-forming metal is titanium.

137. (Withdrawn) A method of fabricating according to claim 133, wherein said step of charging the patterned layer of hydride-forming metal with hydrogen comprises heating the layer of hydride-forming metal under an external hydrogen pressure for a period of time sufficient to convert the hydride-forming metal to the metal hydride.

138. (Withdrawn) A method of fabricating according to claim 137, wherein said hydride-forming metal is heated to a temperature of from approximately 500°C to approximately 600°C.

139. (Withdrawn) A method of fabricating according to claim 133, wherein said external hydrogen pressure is from approximately 1 atm to approximately 5 atm.

140. (Withdrawn) A method of fabricating according to claim 133, wherein said layer of hydride-forming metal is deposited so as to have a thickness of from approximately less than 1 micron to several microns.

141. (Withdrawn) A method of fabricating according to claim 133, further comprising providing feedback circuitry capable of activating said patterned layer of metal

hydride upon demand so as to maintain a desired hydrogen pressure within the semiconductor package.

142. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing on a substrate a layer of doped polycrystalline silicon, said deposition occurring at a first temperature;

patterning said deposited layer of doped polycrystalline silicon to form one or a plurality of thin film resistors capable of serving as heating elements when connected electrically to an external power source;

depositing upon said patterned layer an insulating layer to chemically protect and electrically isolate the one or a plurality of resistors;

depositing upon said insulating layer a layer of hydride-forming metal;

patterning said layer of hydride-forming metal so as to correspond with the patterned layer of the one or a plurality of thin film resistors;

charging said patterned layer of hydride-forming metal with hydrogen so as to provide a patterned layer of metal hydride, said step of charging occurring at a second temperature less than or equal to said first temperature; and

depositing one or a plurality of subsequent low-temperature depositions, wherein said patterned layer of metal hydride remains uncovered by the subsequent low-temperature depositions.

143. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing upon a prepared substrate a layer of polycrystalline silicon;

processing said deposited layer of polycrystalline silicon to remove portions of the deposited layer of polycrystalline silicon and form at least one thin film resistor;

depositing upon an area where said polycrystalline silicon has been removed, and upon said at least one thin film resistor, a layer of electrical contact metal;

processing said deposited layer of electrical contact metal to remove portions of the deposited layer of electrical contact metal and form electrical contacts;

depositing upon said at least one thin film resistor, and upon said electrical contacts, a layer of hydride-forming metal;

processing said layer of hydride-forming metal to remove portions of the deposited layer of hydride-forming metal and form at least one thin film layer of hydride-forming metal;

charging said at least one thin film layer of hydride-forming metal with hydrogen to form at least one thin film layer of metal hydride so as to provide a hydrogen-charged package; and

enclosing said hydrogen-charged package.

144. (Withdrawn) A method of fabricating according to claim 143, wherein said substrate is silicon.

145. (Withdrawn) A method of fabricating according to claim 143, further comprising oxidizing a surface of said silicon substrate.

146. (Withdrawn) A method of fabricating according to claim 143, wherein said polycrystalline silicon is doped polycrystalline silicon.

147. (Withdrawn) A method of fabricating according to claim 143, further comprising implanting said deposited polycrystalline silicon.

148. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of depositing the layer of metal for metal hydride, depositing upon the at least one thin film resistor, and upon the electrical contacts, an insulating layer.

149. (Withdrawn) A method of fabricating according to claim 148, wherein said insulating layer is SiO_2.

150. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of charging the at least one thin film layer of hydride-forming

metal with hydrogen, depositing upon the at least one thin film layer of hydride-forming metal, and upon the electrical contacts, an insulating layer.

151. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of enclosing the package, depositing and processing at least one low-temperature deposition layer, wherein said at least one thin film layer of metal hydride remains uncovered by the at least one low-temperature deposition layer.

152. (Withdrawn) A method of fabricating according to claim 143, wherein said step of processing the deposited layer of polycrystalline silicon to remove portions of the deposited layer of polycrystalline silicon comprises forming a plurality of thin film resistors.

153. (Withdrawn) A method of fabricating according to claim 152, wherein said step of depositing the layer of electrical contact metal comprises depositing upon an area where said polycrystalline silicon has been removed, and upon said plurality of thin film resistors.

154. (Withdrawn) A method of fabricating according to claim 152, wherein said step of depositing the layer of hydride-forming metal comprises depositing upon said plurality of thin film resistors, and upon said electrical contacts.

155. (Withdrawn) A method of fabricating according to claim 154, wherein said step of processing the layer of hydride-forming metal to remove portions of the

deposited layer of hydride-forming metal comprises forming a plurality of thin film layers of hydride-forming metal.

156. (Withdrawn) A method of fabricating according to claim 155, wherein said step of charging the plurality of thin film layers of hydride-forming metal with hydrogen comprises forming a plurality of thin film layers of metal hydride.

157. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of depositing the layer of metal for metal hydride, depositing upon the plurality of thin film resistors, and upon the electrical contacts, an insulating layer.

158. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of charging the plurality of thin film layers of hydride-forming metal with hydrogen, depositing upon the plurality of thin film layers of hydride-forming metal, and upon the electrical contacts, an insulating layer.

159. (Withdrawn) A method of fabricating according to claim 143, further comprising, before said step of enclosing the package, depositing and processing a plurality of low-temperature deposition layers, wherein said plurality of thin film layers of metal hydride remain uncovered by the plurality of low-temperature deposition layers.

160. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing upon a prepared substrate a layer of hydride-forming metal;

processing said layer of hydride-forming metal to remove portions of the deposited layer of hydride-forming metal and form one or a plurality of thin film layers of hydride-forming metal;

charging said one or a plurality of thin film layers of hydride-forming metal with hydrogen to form one or a plurality of thin film layers of metal hydride so as to provide a hydrogen-charged package; and

enclosing said hydrogen-charged package.

161. (Withdrawn) A method of fabricating according to claim 160, wherein said substrate is silicon.

162. (Withdrawn) A method of fabricating according to claim 161, further comprising oxidizing a surface of said silicon substrate.

163. (Withdrawn) A method of fabricating according to claim 160, further comprising, before said step of charging the one or a plurality of thin film layers of hydride-forming metal with hydrogen, depositing upon the one or a plurality of thin film layers of hydride-forming metal, an insulating layer.

164. (Withdrawn) A method of fabricating according to claim 163, wherein said insulating layer is SiO_2.

165. (Withdrawn) A method of fabricating according to claim 160, further comprising, before said step of enclosing the package, depositing and processing one or a plurality of low-temperature deposition layers, wherein said one or a plurality of thin film

layers of metal hydride remain uncovered by the one or a plurality of low-temperature deposition layers.

166. (Withdrawn) A method of fabricating a hydrogen-charged semiconductor package, said method comprising the steps of:

depositing upon a prepared substrate a layer of polycrystalline silicon;

processing said deposited layer of polycrystalline silicon to remove portions of the deposited layer of polycrystalline silicon and form one or a plurality of thin film resistors;

depositing upon an area where said polycrystalline silicon has been removed, and upon said one or a plurality of thin film resistors, a layer of hydride-forming metal;

processing said layer of hydride-forming metal to remove portions of the deposited layer of hydride-forming metal and form one or a plurality of thin film layers of hydride-forming metal;

depositing upon an area where said hydride-forming metal has been removed, and upon said one or a plurality of thin film layers of hydride-forming metal, a layer of electrical contact metal;

processing said deposited layer of electrical contact metal to remove portions of the deposited layer of electrical contact metal and form electrical contacts;

charging said one or a plurality of thin film layers of hydride-forming metal with hydrogen to form one or a plurality of thin film layers of metal hydride so as to provide a hydrogen-charged package; and

enclosing said hydrogen-charged package.

167. (Withdrawn) A hydrogen-charged semiconductor package, said package comprising:

a substrate;

one or a plurality of thin film resistors disposed on said substrate, said resistors comprising polycrystalline silicon;

electrical contacts in communication with said one or a plurality of thin film resistors;

one or a plurality of thin film layers of metal hydride disposed above a respective one of said one or a plurality of thin film resistors so as to provide said package; and

an enclosure for sealing said package.

168. (Withdrawn) A hydrogen-charged semiconductor package according to claim 167, wherein said substrate is silicon.

169. (Withdrawn) A hydrogen-charged semiconductor package according to claim 168, wherein an upper surface of said silicon substrate is oxidized.

170. (Withdrawn) A hydrogen-charged semiconductor package according to claim 167, wherein said polycrystalline silicon is doped.

171. (Withdrawn) A hydrogen-charged semiconductor package according to claim 167, further comprising an insulating layer disposed between said one or a plurality of thin film resistors and said electrical contacts and said one or a plurality of thin film layers of metal hydride.

172. (Withdrawn) A hydrogen-charged semiconductor package according to claim 171, wherein said insulating layer is SiO_2.

173. (Withdrawn) A hydrogen-charged semiconductor package according to claim 167, further comprising an insulating layer disposed above said electrical contacts and said one or a plurality of thin film layers of metal hydride.

174. (Withdrawn) A hydrogen-charged semiconductor package according to claim 167, further comprising one or a plurality of low-temperature deposition layers, wherein said one or a plurality of thin film layers of metal hydride remain uncovered by the one or a plurality of low-temperature deposition layers.

175. (Withdrawn) A hydrogen-charged semiconductor package, said package comprising:

a substrate;

one or a plurality of thin film layers of metal hydride disposed upon said substrate so as to provide said package; and

an enclosure for sealing said package.

176. (Withdrawn) A hydrogen-charged semiconductor package according to claim 175, wherein said substrate is silicon.

177. (Withdrawn) A hydrogen-charged semiconductor package according to claim 176, wherein an upper surface of said silicon substrate is oxidized.

178. (Withdrawn) A hydrogen-charged semiconductor package according to claim 175, further comprising an insulating layer disposed above said one or a plurality of thin film layers of metal hydride.

179. (Withdrawn) A hydrogen-charged semiconductor package according to claim 175, further comprising one or a plurality of low-temperature deposition layers, wherein said one or a plurality of thin film layers of metal hydride remain uncovered by the one or a plurality of low-temperature deposition layers.

180. (Withdrawn) A memory device comprising a semiconductor package, said semiconductor package comprising:

a hermetically sealed enclosure;

a semiconductor chip within said enclosure;

a source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

181. (Withdrawn) A system comprising:

a processor;

a memory device coupled to said processor, at least one of said processor and said memory device being contained in a semiconductor package, said package comprising:

a hermetically sealed enclosure;

a semiconductor chip within said enclosure;

a source of releasable hydrogen within said enclosure; and

a gas at an elevated pressure within said enclosure,

said gas comprising a first gas component and a second gas component, wherein said second gas component results from the release of said releasable hydrogen, and wherein said first gas component is initially present within said enclosure prior to the release of said releasable hydrogen, and said first gas component is initially present at a pressure lower than said elevated pressure.

182. (Withdrawn) A method of providing a heat conductive semiconductor package, said method comprising the steps of:

fabricating a semiconductor chip comprising a source of releasable hydrogen; and

hermetically sealing said fabricated chip, and a gas, within an enclosure.

183. (Withdrawn) A method according to claim 182, wherein said source of releasable hydrogen is a metal hydride.